

**UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION**

Page 1 of 1

PATENT NO. : 7,455,926

APPLICATION NO.: 10649,869

ISSUE DATE : November 25, 2008

INVENTOR(S) : Takehisa TAKAGI et al.

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Please correct claim 1, at column 7, between lines 33 and 34, insert --plates, the blowers being provided on the fuel cell to face--.

MAILING ADDRESS OF SENDER (Please do not use customer number below):

BROWDY AND NEIMARK, PLLC
624 Ninth Street, NW, Suite 300
Washington, D.C. 20001-5303

This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Atty. Docket: TAKAGI=11

In re Patent of:)	Conf. No.: 6355
)	
Takehisa TAKAGI)	
)	
Patent No.: 7,455,926)	Washington, D.C.
)	
Issued: November 25, 2008)	February 26, 2009
)	
For: AIRBREATHING FUEL CELL)	ATTN: Certificate of
)	Correction Division

REQUEST FOR EXPEDITED ISSUANCE OF CERTIFICATE OF CORRECTION
UNDER 37 C.F.R. §1.322

Honorable Commissioner for Patents
U.S. Patent and Trademark Office
ATTN: Certificate of Correction Branch
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In checking over the printed copy of the above-identified patent, we have found the following errors that are entirely the fault of the Patent and Trademark Office. It is respectfully requested that these errors be corrected in accordance with 37 CFR §1.322(a) and that the issuance of the certificate be expedited in accordance with MPEP §1480.01. The errors to be corrected are listed below.

Claim 1, column 7, between lines 33 and 34, after oxygen passage, insert --plates, the blowers being provided on the fuel cell to face--.

This line appeared in claim 1 as amended on December 31, 2007. In the examiner's amendment attached to the Notice of Allowance dated July 22, 2008, the examiner omitted that line, we assume inadvertently. Because of that omission, the claim clause no longer makes sense.

We are attaching one copy of the amendment of December 31, 2007, wherein at page 3 which shows amended claim 1, second paragraph, the language is clearly shown as:

"wherein said fuel cell further comprises blowers for blasting air into the grooves formed on the oxygen passage plates, the blowers being provided on the fuel cell to face the grooves,"

Attached also is a copy of the examiner's amendment, which accompanied the Notice of Allowance dated July 22, 2008. On page 4, first paragraph where it states:

"wherein said fuel cell further comprises blowers for blasting air into the grooves formed on the oxygen passage the grooves,"

In accordance with MPEP §1480.01, this certificate is entitled to expedited issuance as the error is attributable solely to the Office. As proof that unequivocally supports

patentee's assertions, attached hereto is the following supporting documentation:

- 1) A full copy of the amendment filed on December 31, 2007, indicating that the amended claim 1 included the omitted language.
- 2) A full copy of the examiner's amendment attached to the Notice of Allowance, which clearly shows the omitted language on page 4, first paragraph.

Accordingly, granting of this request and issuance of the attached certificate of correction on an expedited basis are earnestly solicited.

Respectfully submitted,

BROWDY AND NEIMARK, P.L.L.C.
Attorneys for Applicant(s)

By /jmf/
Jay M. Finkelstein
Registration No. 21,082

JMF:jhw
Telephone No.: (202) 628-5197
Facsimile No.: (202) 737-3528
G:\BN\A\ASAM\Takagi11\Pto\2009-02-26CertCor322PTOFault.doc



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

1444 7590 07/22/2008

BROWDY AND NEIMARK, P.L.L.C.
624 NINTH STREET, NW
SUITE 300
WASHINGTON, DC 20001-5303

EXAMINER

LEWIS, BEN

ART UNIT

PAPER NUMBER

1795

DATE MAILED: 07/22/2008

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/649,869	08/28/2003	Takehisa Takagi	TAKAGH11	6355

TITLE OF INVENTION: AIRBREATHING FUEL CELL

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1440	\$300	\$0	\$1740	10/22/2008

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. **PROSECUTION ON THE MERITS IS CLOSED.** THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN **THREE MONTHS** FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. **THIS STATUTORY PERIOD CANNOT BE EXTENDED.** SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

- A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.
- B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

- A. Pay TOTAL FEE(S) DUE shown above, or
- B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or **Fax** (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

1444 7590 07/22/2008

BROWDY AND NEIMARK, P.L.L.C.
624 NINTH STREET, NW
SUITE 300
WASHINGTON, DC 20001-5303

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/649,869	08/28/2003	Takehisa Takagi	TAKAGI11	6355

TITLE OF INVENTION: AIRBREATHING FUEL CELL

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1440	\$300	\$0	\$1740	10/22/2008

EXAMINER	ART UNIT	CLASS-SUBCLASS
LEWIS, BEN	1795	429-038000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
- (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____
- 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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P.O. Box 1450
Alexandria, Virginia 22313-1450
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/649,869	08/28/2003	Takehisa Takagi	TAKAGI11	6355

1444 7590 07/22/2008
BROWDY AND NEIMARK, P.L.L.C.
624 NINTH STREET, NW
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WASHINGTON, DC 20001-5303

EXAMINER

LEWIS, BEN

ART UNIT	PAPER NUMBER
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1795

DATE MAILED: 07/22/2008

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 574 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 574 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability	Application No.	Applicant(s)	
	10/649,869	TAKAGI ET AL.	
	Examiner	Art Unit	
	Ben Lewis	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Applicant's remarks submitted on 12/31/07.
2. ☒ The allowed claim(s) is/are 1, 4, 5 and 12-17.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. <input type="checkbox"/> Notice of References Cited (PTO-892) 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____ 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | <ol style="list-style-type: none"> 5. <input type="checkbox"/> Notice of Informal Patent Application 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____ 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance 9. <input type="checkbox"/> Other _____ |
|---|---|

DETAILED ACTION

Examiners's Amendment

An examiner's amendment on the record appears below. Should changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Jay M. Finkelstein on March 27th, 2008. The application has been amended as Follows:

IN THE CLAIMS

1. (Currently Amended) An airbreathing fuel cell comprising end plates, a unit cell having a central core, said unit cell being disposed between the two end plates, a fuel distribution manifold disposed centrally of the unit cell to

supply a fuel thereto, a single tie bolt extending centrally of the fuel distribution manifold and of the unit cell to unite these elements, fixing nuts screwed onto both ends of the tie bolt to integrally clamp the unit cell between the end plates with O-rings or the like therebetween, and

a cell stack formed by stacking a plurality of those unit cells, which comprise a solid polymer electrolyte membrane, an oxygen electrode and a fuel electrode, which are provided on both sides of the solid polymer electrolyte membrane to be opposed to each other,

a porous oxygen passage plate provided adjacent and toward the oxygen electrode of each unit cell,

separator plates provided adjacent and outside the oxygen passage plate and the fuel electrode,

wherein the oxygen passage plate comprises a plurality of opened grooves on a surface thereof opposed to the oxygen electrode, each of the grooves having two ends that are opened to an outer periphery of the porous oxygen passage plate and not extending to and therefore being closed to the central bore, such that the grooves of the oxygen passage plate faces away from the oxygen electrode.

wherein said fuel cell further comprises blowers for blasting air into the grooves formed on the oxygen passage the grooves,

wherein the blowers are arranged in opposition to the both opened ends of the grooves on the oxygen passage plates of the cell stack to blast air into the grooves, whereby air can be supplied centrally of the oxygen passage plates from both ends of the grooves, and further

wherein air supplied by the blowers passes through the porous oxygen plate from the grooves to the oxygen electrode of each unit cell.

16. (New) An airbreathing fuel cell comprising end plates, a unit cell having a central core, said unit cell being disposed between the two end plates, a fuel distribution manifold disposed centrally of the unit cell to supply a fuel thereto, a single tie bolt extending centrally of the fuel distribution manifold and of the unit cell to unite these elements, fixing nuts screwed onto both ends of the tie bolt to integrally clamp the unit cell between the end plates with O-rings or the like therebetween, and

a cell stack formed by stacking a plurality of those unit cells which comprise a solid polymer electrolyte membrane, an oxygen electrode and a fuel electrode, which are provided on both sides of the solid polymer electrolyte membrane to be opposed to each other,

a porous oxygen passage plate provided adjacent and toward the oxygen electrode,

separator plates provided adjacent and outside the oxygen passage plate and the fuel electrode,

wherein the oxygen passage plate comprises a plurality of opened grooves on a surface thereof opposed to the oxygen electrode, each of the grooves having two ends that are opened to an outer periphery of the porous oxygen passage plate and not extending to and therefore being closed to the central bore, such that the grooves of the oxygen passage plate faces away from the oxygen electrode,

wherein said fuel cell further comprises blowers for blasting an air into the grooves formed on the oxygen passage plates, the blowers being provided on the fuel cell to face the grooves, the blowers being arranged in opposition to the

Art Unit: 1795

both opened ends of the grooves on the oxygen passage plates of the cell stack to blast air into the grooves, whereby air can be supplied centrally of the oxygen passage plates from both ends of the grooves,

wherein the blowers for the cell stack are provided at least one by one on sides of the both opened ends of the grooves of the oxygen passage plates and on respective sides in parallel to the grooves, and the blowers provided on the opposed sides are provided in opposition to each other respectively to blast an air to the oxygen passage plates,

wherein an outer peripheral surface of the cell stack is rectangular in shape, and

wherein said blowers are operative to forcibly feed air into said grooves in order to provide compressed air in said grooves.

Claims 6-11 are cancelled.

REASONS FOR ALLOWANCE

Claims 1, 4, 5 and 12-17 are allowed.

The prior art does not teach or suggest a fuel cell including all of the claimed features. The most pertinent art includes Kenyon et al. (U.S. Patent No. 6,423,437 B1) and Kitagawa et al. (U.S. Pub. No. 6,773,843 B2).

Both the Kenyon et al. and Kitagawa et al. do not teach or suggest an airbreathing fuel cell wherein the oxygen passage plate comprises a plurality of opened grooves on a surface thereof opposed to the oxygen electrode, each of the grooves having two ends that are opened to an outer periphery of the porous oxygen passage plate and not extending to and therefore being closed to the central bore, such that the grooves of the oxygen passage plate faces away from the oxygen electrode as claimed by Applicants in claims 1 and 16.

For these reasons, the claims are allowed over the prior art. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ben Lewis whose telephone number is 571-272-6481. The examiner can normally be reached on 8:30am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ben Lewis/
Examiner, Art Unit 1795

/PATRICK RYAN/
Supervisory Patent Examiner, Art Unit 1795

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of: Takehisa TAKAGI et al.

Art Unit: 1745

Application No.: 10/649,869

Confirmation No.: 6355

Examiner: Ben Lewis

Filing Date: August 28, 2003

Washington, D.C.

371(c) Date:

Atty.'s Docket: TAKAGI=11

For: AIRBREATHING FUEL CELL

Date: December 31, 2007

U.S. Patent and Trademark Office
Customer Service Window
Randolph Building, **Mail Stop AMENDMENT**
401 Dulany Street
Alexandria, VA 22314

Sir:

Transmitted herewith is an [X] Amendment in the above-identified application.

[] Small Entity Status: Applicant(s) claim small entity status. See 37 C.F.R. §1.27.

[XX] No additional fee is required.

[] The fee has been calculated as shown below:

(Col. 1)			(Col. 2)		(Col. 3)	SMALL ENTITY		OTHER THAN SMALL ENTITY		
	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NO. PREVIOUSLY PAID FOR		PRESENT EXTRA EQUALS	RATE	ADDITIONAL FEE	OR	RATE	ADDITIONAL FEE
TOTAL	* 15	MINUS	** 20		0	x 25	\$		x 50	\$
INDEP.	* 3	MINUS	*** 3		0	x 105	\$		x 210	\$
FIRST PRESENTATION OF MULTIPLE DEP. CLAIM										
						ADDITIONAL FEE TOTAL	\$	OR	TOTAL	\$

* If the entry in Col. 1 is less than the entry in Col. 2, write "0" in Col. 3.

** If the "Highest Number Previously Paid for" IN THIS SPACE is less than 20, write "20" in this space.

*** If the "Highest Number Previously Paid for" IN THIS SPACE is less than 3, write "3" in this space.

The "Highest Number Previously Paid For" (total or independent) is the highest number found from the equivalent box in Col. 1 of a prior amendment of the number of claims originally filed.

[XX] Conditional Petition for Extension of Time

If any extension of time for a response is required, applicant requests that this be considered a petition therefor.

[] It is hereby petitioned for an extension of time in accordance with 37 CFR 1.136(a). The appropriate fee required by 37 CFR 1.17 is calculated as shown below:

Small Entity

Response Filed Within

[] First - \$ 60.00

[] Second - \$ 230.00

[] Third - \$ 525.00

[] Fourth - \$ 820.00

Month After Time Period Set

Other Than Small Entity

Response Filed Within

[] First - \$ 120.00

[] Second - \$ 460.00

[] Third - \$ 1050.00

[] Fourth - \$ 1640.00

Month After Time Period Set

[] Less fees (\$) already paid for ___ month(s) extension of time on _____.

[] Please charge my Deposit Account No. 02-4035 in the amount of \$_____.

[] Credit Card Payment Form, PTO-2038, is attached, authorizing payment in the amount of \$_____.

[] A check in the amount of \$_____ is attached (check no. _____).

[XX] The Commissioner is hereby authorized and requested to charge any additional fees which may be required in connection with this application or credit any overpayment to Deposit Account No. 02-4035. This authorization and request is not limited to payment of all fees associated with this communication, including any Extension of Time fee, not covered by check or specific authorization, but is also intended to include all fees for the presentation of extra claims under 37 CFR §1.16 and all patent processing fees under 37 CFR §1.17 throughout the prosecution of the case. This blanket authorization does not include patent issue fees under 37 CFR §1.18.

BROWDY AND NEIMARK, P.L.L.C.

Attorneys for Applicant(s)

Facsimile: (202) 737-3528
Telephone: (202) 628-5197

By: /jmf/
Jay M. Finkelstein
Registration No. 21,082

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

ATTY.'S DOCKET: TAKAGI=11

In re Application of:)	Confirmation No.: 6355
)	
Takehisa TAKAGI et al)	Art Unit: 1745
)	
Appln. No.: 10/649,869)	Examiner: Ben Lewis
)	
Filing Date: August 28, 2003)	December 31, 2007
)	
For: AIRBREATHING FUEL CELL)	

AMENDMENT

Customer Service Window, Mail Stop Amendment
Honorable Commissioner for Patents
U.S. Patent and Trademark Office
Randolph Building, 401 Dulany Street
Alexandria, Virginia 22314

Sir:

In response to the examiner's action dated October
3, 2007, please amend as follows:

Amendments to the Claims are reflected in the
listing of claims that begins on page 2 of this paper.

Remarks/Arguments begin on page 9 of this paper.

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Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) An airbreathing fuel cell comprising end plates, a unit cell having a central core, said unit being ~~and~~ disposed between the two end plates, a fuel distribution manifold disposed centrally of the unit cell to supply a fuel thereto, a single tie bolt extending centrally of the fuel distribution manifold and of the unit cell to unite these elements, fixing nuts screwed onto both ends of the tie bolt to integrally clamp the unit cell between the end plates with O-rings or the like therebetween, and

a cell stack formed by stacking a plurality of those unit cells, which comprise a solid polymer electrolyte membrane, an oxygen electrode and a fuel electrode, which are provided on both sides of the solid polymer electrolyte membrane to be opposed to each other,

a porous oxygen passage plate provided adjacent and toward the oxygen electrode of each unit cell, and

separator plates provided adjacent and outside the oxygen passage plate and the fuel electrode, and

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wherein the oxygen passage plate comprises a plurality of opened grooves on a surface thereof opposed to the oxygen electrode, ~~and the~~ each of the grooves having two ends that are opened to an outer periphery of the porous oxygen passage plate and not extending to and therefore being closed to the central bore,

wherein said fuel cell further comprises blowers for blasting air into the grooves formed on the oxygen passage plates, the blowers being provided on the fuel cell to face the grooves,

wherein the blowers are arranged in opposition to the both opened ends of the grooves on the oxygen passage plates of the cell stack to blast air into the grooves, whereby air can be supplied centrally of the oxygen passage plates from both ends of the grooves, and further

wherein air supplied by the blowers passes through the porous oxygen plate from the grooves to the oxygen electrode of each unit cell.

2-3. (Canceled)

4. (Currently amended) The airbreathing fuel cell according to claim 31, wherein the blowers for the cell stack are provided at least one by one on sides of the both opened ends of the grooves of the oxygen passage plates and on

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respective sides in parallel to the grooves, and the blowers provided on the opposed sides are provided in opposition to each other respectively to blast an air to the oxygen passage plates.

5. (Currently amended) The airbreathing fuel cell according to ~~any one of claims 1 to 4~~claim 1 or 4, wherein an outer peripheral surface of the cell stack is rectangular in shape.

6. (Withdrawn) In an airbreathing fuel cell comprising at least one unit cell having a central bore extending therethrough, each said unit cell comprising, between a pair of separator plates, and in adjacent relationship, a fuel electrode, a solid electrolyte membrane, an oxygen electrode and a porous oxygen passage plate, the improvement wherein

the porous oxygen passage plate comprises a plurality of oxygen passage grooves in a surface of said porous oxygen passage plate which faces away from said oxygen electrode and toward a said separator plate, the grooves being open to an outer periphery of the porous oxygen passage plate and not extending to and therefore being closed to the central bore.

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7. (Withdrawn) The airbreathing fuel cell according to claim 6 comprising a generally circular rib surrounding the bore which provides the closing of the grooves to the bore.

8. (Withdrawn) The airbreathing fuel cell of claim 7 further comprising a generally circular groove surrounding said generally circular rib.

9. (Withdrawn) The airbreathing fuel cell according to any one of claims 6-8, wherein the outer periphery of the unit cell is rectangular in shape.

10. (Withdrawn) The airbreathing fuel cell of claim 9, further comprising at least one blower adapted to force air into said grooves.

11. (Withdrawn) The airbreathing fuel cell according to any one of claims 6-8 further comprising at least one blower adapted to force air into said grooves.

12. (Previously presented) The airbreathing fuel cell according to claim 1, wherein said porous oxygen passage plate is made of carbon.

13. (Currently amended) The airbreathing fuel cell according to claim 1, ~~further comprising means for~~wherein said blowers are operative to forcibly feed air into said

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grooves in order to provide compressed air ~~having a high density in~~ said grooves.

14. (New) The airbreathing fuel cell according to claim 13, wherein the porous oxygen passage plate has a central portion surrounding the fuel distribution manifold, and at least several of the grooves extend through the central portion so that the blowers are operative to provide compressed air through the several grooves to the central portion.

15. (New) The airbreathing fuel cell according to claim 1, wherein the porous oxygen passage plate has a central portion surrounding the fuel distribution manifold, and at least several of the grooves extend through the central portion so that the blowers are operative to provide compressed air through the several grooves to the central portion.

16. (New) An airbreathing fuel cell comprising end plates, a unit cell having a central core, said unit being disposed between the two end plates, a fuel distribution manifold disposed centrally of the unit cell to supply a fuel thereto, a single tie bolt extending centrally of the fuel distribution manifold and of the unit cell to unite these elements, fixing nuts screwed onto both ends of the tie bolt

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to integrally clamp the unit cell between the end plates with O-rings or the like therebetween, and

a cell stack formed by stacking a plurality of those unit cells, which comprise a solid polymer electrolyte membrane, an oxygen electrode and a fuel electrode, which are provided on both sides of the solid polymer electrolyte membrane to be opposed to each other,

a porous oxygen passage plate provided adjacent and toward the oxygen electrode,

separator plates provided adjacent and outside the oxygen passage plate and the fuel electrode,

wherein the oxygen passage plate comprises a plurality of opened grooves on a surface thereof opposed to the oxygen electrode, each of the grooves having two ends that are opened to an outer periphery of the porous oxygen passage plate and not extending to and therefore being closed to the central bore,

wherein said fuel cell further comprises blowers for blasting an air into the grooves formed on the oxygen passage plates, the blowers being provided on the fuel cell to face the grooves, the blowers being arranged in opposition to the both opened ends of the grooves on the oxygen passage plates of the cell stack to blast air into the grooves, whereby air

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can be supplied centrally of the oxygen passage plates from both ends of the grooves,

wherein the blowers for the cell stack are provided at least one by one on sides of the both opened ends of the grooves of the oxygen passage plates and on respective sides in parallel to the grooves, and the blowers provided on the opposed sides are provided in opposition to each other respectively to blast an air to the oxygen passage plates,

wherein an outer peripheral surface of the cell stack is rectangular in shape, and

wherein said blowers are operative to forcibly feed air into said grooves in order to provide compressed air in said grooves.

17. (New) The airbreathing fuel cell according to claim 16, wherein the porous oxygen passage plate has a central portion surrounding the fuel distribution manifold, and at least several of the grooves extend through the central portion so that the blowers are operative to provide compressed air through the several grooves to the central portion.

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REMARKS

The Examiner's action dated October 3, 2007, has been received, and its contents carefully noted.

In response to the formal rejection of claim 13, that claim has been amended to define the air in the grooves as "compressed"; support for this term will be found throughout the specification, for example at page 6, line 2. It is submitted that this term should properly be considered definite since those skilled in the art are readily aware that "compressed air" is air that is at a pressure higher than atmospheric.

In order to further advance matters, claim 1 has been amended to now include the subject matter of previous claims 2 and 3, which have themselves been cancelled, and to contain minor improvements in form. Since claims 2 and 3 previously depended from claim 1, these amendments to claim 1 DO NOT RAISE ANY NEW ISSUES.

The remaining claims have been amended, where necessary, to provide proper dependency and new claims 14-17 have been added for the Examiner's consideration. Support for the recitations in claims 14, 15 and 17 will be found in the specification, for example at page 9, lines 19-24 and page 11,

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lines 2-6. New claim 16 combines the subject matter of the present version of claim 1 with the subject matter of present claims 4, 5 and 13.

In view of the amendments to claim 1 and the content of new independent claim 16, and particularly the fact that each of those claims includes the subject matter of original claim 3, is believed that all of the prior art rejections have been rendered moot, with the exception of the rejection presented in Section 8 of the action and that rejection is respectfully traversed.

It will be recalled that a personal interview was held with Examiners Lewis and Tsang-Foster on June 19, 2007, and an Amendment was filed on July 6, 2007. During the personal interview, significant patentable differences between the invention, as then claimed, and the prior art were pointed out and these points were amplified in the Amendment filed on July 6, 2007.

However, the present office Action does not contain any acknowledgement of the substantive arguments presented during that interview, or of the expanded arguments presented in the previous Amendment and does not contain any response to those arguments. Indeed, the present action does not even acknowledge that the personal interview took place. It is

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believed that when an applicant traverses any rejection, the Examiner should, if the rejection is repeated, take note of the applicant's argument and answer the substance of it. MPEP 707.07(f). If the present Amendment does not place the application in allowable condition, it is asked that such response be provided. Accordingly, the statement of the substance of the interview and the essential arguments made in the previous Amendment are reproduced below.

STATEMENT OF SUBSTANCE OF INTERVIEW

During the interview held on June 19, 2007, the references of record were discussed and undersigned counsel explained how the present claims overcome the rejections of record.

In particular, three basic points were made:

1- The present application and the primary reference (Kenyon) are directed to passive airbreathing fuel cells, whereas the other applied references disclose active fuel cells. The considerations underlying the construction of fuel cells of one type are different in significant respects from those underlying the construction of fuel cells of the other type. Basically, those skilled in the art do not consider it to be

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"obvious" to modify a fuel cell of one type to include a feature of fuels cells of the other type.

2- The present invention distinguishes over the prior art by the provision of grooves in the porous oxygen passage plate, at the side the faces away from the oxygen electrode, whereas the primary reference does not disclose any grooves and the components that are provided with grooves in the secondary references are not porous oxygen passage plates and have grooves at the side facing the associated oxygen electrode.

3- A particular object of the present invention is to provide compressed, or high density, air in the grooves, which is not disclosed in any of the applied references.

* * * *

In order to advance prosecution, claim 1 was previously amended only in a minor respect, i.e. to provide proper antecedent basis for the reference to the "porous" oxygen passage plate, and dependent claims 12 and 13 were added to more clearly define two particular features of the invention, which is that the porous oxygen passage plate is made of carbon and that the fuel cell comprises means for forcibly feeding air into the grooves in order to provide air

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having a high density in the grooves. Support for the recitations appearing in the added dependent claims will be found in the specification at page 9, line 4 and page 5, line 25-page 6, line 10, respectively.

The rejection claims 1, 2 and 5 as unpatentable over Kenyon in view of Lee was traversed for the reason that neither of these references discloses a fuel cell having a porous oxygen passage plate provided with a plurality of opened grooves on a surface thereof opposed to the oxygen electrode, the grooves being opened to an outer periphery of a porous oxygen passage plate and not extending to, and therefore being closed to, the central bore.

In the office action of March 7, 2007, the examiner asserted that the primary reference, Kenyon, discloses a passive airbreathing fuel cell having a plurality of fuel cell units, each unit including a porous oxygen passage plate. However, the explanation of the rejection included an acknowledgement that this reference does not disclose an oxygen passage plate having a plurality of **grooves**.

The purpose of the provision of a plurality of grooves in the oxygen passage plate according to the present invention is to enable an increased flow of oxygen into the fuel cell so that there is an ample supply of oxygen across

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the entire surface of the oxygen passage plate, and thus an increased flow of oxygen to the entire area of the polymer electrolyte membrane.

Because this essential feature of the present invention is lacking from the Kenyon disclosure, reliance has been placed on a secondary reference, Lee, which discloses only active fuel cells. The explanation of this rejection points out that Lee discloses a cooling system in which non-porous electrically conductive plates may contain an array of grooves in the faces that define a reactant flow field for distributing the fuel cell's gaseous reactants.

According to the disclosure provided in the Lee reference, each membrane electrode assembly 4, 6 is sandwiched between two porous gas permeable sheets, such as the sheets 34 and 36 sandwiching membrane electrode assembly 4. Reactant flow fields composed of a plurality of flow channels are provided in plate assemblies 8, 14 and 16. Lee explicitly discloses that each of these plate assemblies is **non-porous**. In fact, in view of the locations of those plates, it would make no sense to make them porous.

Thus, it is clear that Lee does not disclose the provision of a plurality of grooves in a porous oxygen passage plate, on a surface of that plate that is opposed to the

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oxygen electrode, and thus does not supply the disclosure that is lacking from Kenyon.

It follows that no reasonable combination of the teachings of these applied references would result in the fuel cell defined in even the previous version of application claim 1.

Moreover, those skilled in the art would have no logical reason to modify the passive fuel cell of Kenyon according to the teachings of Lee because these references disclose two fundamentally different types of fuel cells.

Active type fuel cells, such as that disclosed by Lee, are of the type normally used in motor vehicles or for home use, in which hydrogen and air are continuously and forcibly fed into the fuel cell from external sources. A portion of this hydrogen and oxygen react together and contribute to the generation of electric power, while the portions that are not reacted are discharged out of the fuel cell, the discharged hydrogen being fed back to the fuel cell by a circulating pump.

In contrast, passive fuel cells, such as that disclosed by Kenyon, receive hydrogen from a gas cylinder under pressure, while air is allowed to flow into the fuel

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cell under atmospheric pressure. During operation of such a fuel cell, there is no continuous withdrawal of unused reactants.

Thus, one distinguishing characteristic of active fuel cells is that they require auxiliary equipment for positively feeding both hydrogen and air and for withdrawing unused reactants. The electric power required for operating this equipment must be generated by the fuel cell, reducing the power available for other uses.

For the above reasons, those skilled in the art would understand that features of active type fuel cells cannot necessarily be incorporated into passive type fuel cells.

Furthermore, the present invention differs from any device that could be obtained by combining the teachings of the applied references by the fact that the open grooves are on a surface of the porous oxygen passage plate that is opposed to the oxygen electrode. When, as in the case of the present invention, the grooves for supplying oxygen are provided on the side of the oxygen passage plate that faces away from the oxygen electrode, and the oxygen passage plate is clamped against the oxygen electrode by end plates, such as plate 24 shown in Figure 9 of the present application, the

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contact pressure between the oxygen passage plate and the oxygen electrode is more uniform than would be the case if the grooves were provided in a metal clamping plate adjacent to the oxygen passage plate, with the grooves and their associated lands being directed toward the oxygen passage plate, as disclosed by Lee (and Reiser).

Thus, claim 1, as previously presented, distinguished over any reasonable combination of the teachings of the applied references by its recitation of a porous oxygen passage plate provided adjacent and toward the oxygen electrode and comprising a plurality of opened grooves on a surface thereof opposed to the oxygen electrode, the grooves being closed to the central bore.

In connection with the above-cited claim recitations, it should also be noted that Kenyon does not disclose any grooves at all and the secondary reference does not disclose a porous plate or grooves on the side of the plate opposed to the oxygen electrode and that are closed to a central bore.

Even though, for reasons set forth above, the previous version of claim 1 clearly distinguished patentably over the prior art, claim 1 has now been amended to include

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the further significant features previously defined in pending claims 2 and 3.

In view of the amendments now made to claim 1 (to include all of the subject matter of claims 2 and 3), and the fact that the Lee reference was not relied upon to support the rejection of claim 3, the Lee reference will not be discussed further.

Claim 1 now further recites blowers for blasting air into the grooves. This feature, which is recognized to not be disclosed by Kenyon, would certainly be contrary to the Kenyon disclosure, which relate only to passive fuel cells, one characteristic of passive fuel cells being that they do not provide any forced air flow.

Claim 1 also further distinguishes over any reasonable combination of the teachings of the applied references by its recitation that the blowers are arranged in opposition to both opened ends of the grooves. Of course, the result of this arrangement is to force air into the grooves from both ends thereof, thereby necessarily creating compressed air in the grooves.

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As already noted above, it would be contrary to the teachings of Kenyon to add any air blowers to the passive air cells disclosed therein.

The secondary reference relied upon to support this rejection, Reiser, discloses an active fuel cell. Therefore, all of the arguments presented above regarding the absence of any motivation for those skilled in the art to combine teachings relating to, respectively, a passive fuel cell and an active fuel cell are equally applicable to the previous rejection of presently amended claim 1 (which incorporates previous claim 3).

Moreover, Reiser fails to supply the feature, missing from Kenyon, relating to the provision of a porous oxygen passage plate provided adjacent the oxygen electrode and provided with a plurality of opened grooves on a surface thereof opposed to the oxygen electrode.

Reiser does not, in fact, appear to disclose a porous oxygen passage plate. In the fuel cell disclosed in this reference, for example as illustrated in Figure 3D thereof, grooves 28 are formed in the side of a plate 40 that faces toward cathode 22. Plate 40 is **not** an oxygen passage plate, but is only disclosed as being provided to allow water removal. Reference is made to the explanation provided

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earlier herein regarding the benefit of providing grooves at the side of the oxygen passage plate that is opposed to the oxygen electrode.

It is therefore clear that one skilled in the art could not derive from the Reiser patent any suggestion for providing a porous oxygen passage plate with grooves at the side of that plate that faces away from the oxygen electrode.

Moreover, it appears that Reiser does not even disclose a component that can be equated to the oxygen passage plate defined in application claim 1 because there is no disclosure in this reference that oxygen passes through any of the plates provided with grooves.

Furthermore, the addition of blowers to the passive fuel cell of Kenyon would be clearly contrary to the disclosure of that reference, which relates to a passive fuel cell.

Wholly aside from the facts set forth above, it would certainly be contrary to the teachings of Reiser to arrange blowers in opposition to both opened ends of the grooves. Reiser clearly discloses an arrangement in which air is caused to flow across the fuel cell, being introduced at one side thereof and being withdrawn through an outlet

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manifold 14B at the other side thereof. The entire purpose of the arrangement disclosed by Reiser is to produce a continuous flow of air through the fuel cell. This is directly contrary to an arrangement of the type now defined in claim 1, in which air is blown in at both ends of the grooves, creating compressed air within the grooves and essentially allowing air to exit only through the porous oxygen passage plate.

With regard to the entirety of the explanation of this rejection, as presented on page 9 of the Action, it can only be reiterated that to arrange blowers in the manner now defined in claim 1 of the present application would be directly contrary to the teachings of Reiser and would provide an effect, that is compressed air, that is directly contrary to the effect intended by Reiser, which is a continuous flow of air across the fuel cell.

Moreover, the arrangement of grooves disclosed by Reiser **cannot be employed in a fuel cell** having the form disclosed by Kenyon, which includes a central core that is separated from the region containing oxygen and that constitutes a source of fuel.

The reasoning presented in support of the previous rejection of application claim 3 seems to be contrary to the basic principles underlying determinations of patentability.

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This reasoning appears to be that a feature that is not disclosed or suggested anywhere in the prior art (providing blowers at both ends of grooves in order to create compressed air within the grooves), and which is, in fact, contrary to the teachings of the applied references, is nevertheless "obvious" because it "would increase the performance of the fuel cell". Quite to the contrary, it is the understanding of undersigned counsel that if a novel feature that is not known in or suggested by the prior art produces an improvement, this is clear evidence of unobviousness, and hence patentability.

The rejection is unjustified because the fact that the novel arrangement of blowers according to the present invention would increase the performance of the fuel cell is something that was not known in the art. The only evidence that the invention produces an increase in performance is found in the present specification itself. A finding of obviousness is simply unjustified when there is no evidence of prior art knowledge that the novel feature of the invention would produce an improvement.

Moreover, there is no known principle that would lead one skilled in the art to believe that supplying oxygen from compressed air in a fuel cell would lead to any operating improvement. Knowledge of this can only be found in the

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specification of the present application, and nowhere in the prior art.

The simple fact is this: disclosures in the specification of an application under examination cannot be relied upon to support an obviousness rejection. If the only disclosure that a modification of the prior art produces an improvement is found in the application self, this cannot serve as the basis for a holding of obviousness.

The present invention not only produces an improvement, but actually produces a surprisingly substantial improvement. Figures 7 and 8 of the present application present documentary evidence that **both** the provision of grooves in a porous oxygen passage plate **and** the blowing in of air from both ends of the grooves produces a substantial increase in the current produced by a particular fuel cell. Taking into account that research into fuel cells has been conducted by many institutions over many years, it must be concluded that the improvements demonstrated in Figures 7 and 8 of the present application are surprising and, in any event, go far beyond any improvement that these features might be expected to produce.

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This having been said, it must be reiterated that the prior art does not suggest either of the novel features whose effects are depicted in Figures 7 and 8.

In summary, it is submitted that no one skilled in the art could possibly, even with the Kenyon and Reiser disclosures before them, envision a fuel cell having porous oxygen passage plates provided with grooves as defined in application claim 1, or a fuel cell having blowers that blow air into each of the grooves from both ends thereof. Thus, there is simply no proper evidentiary support for the rejection of previous claim 3, and thus presently amended claim 1.

Claim 5, which depends from amended claim 1, further distinguishes over the applied references by its recitation that the outer peripheral surface of the cell stack is rectangular in shape. This shape is clearly different from the shape disclosed by Kenyon. In connection with this point, it is submitted that the assertion presented in the last two lines on page 5 of the Action is simply incorrect; there is no disclosure in Kenyon that the embodiment shown in Figure 6 thereof has an outer peripheral surface that is rectangular in shape.

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Claim 12 further distinguishes over the applied references by specifying that the oxygen passage plate is made of carbon. This is a material that can be provided with grooves more easily than the metal plates disclosed by Reiser.

Claim 13 clearly distinguishes over the applied references by its explicit recitation of a basic novel feature of the invention which, is noted above, represents an effect that is directly contrary to that which occurs in the fuel cell of Reiser.

Added claims 14, 15 and 17 further define the structure of a fuel cell according to the invention according to which the blowers are operative to provide compressed air through the several grooves to the central portion. Support for these claims will be found in the specification at page 10, line 27 to page 11, line 6. It is submitted that the limitations in these claims are not found anywhere in the prior art of record.

Added claim 16 contains the essential subject matter of claims 1, 4, 5 and 13.

Furthermore, it is now requested that the Restriction Requirement be withdrawn in view of the fact that

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claims 6-11 do, in fact, define the same apparatus, and in fact the same embodiments, as claims 1-5, 12 and 13.

In view of the foregoing it is requested that the Restriction Requirement be withdrawn, that all claims be examined on the merits, that the prior art rejections be reconsidered and withdrawn, that claims 1-17 be allowed, and that the application be found in allowable condition.

If the above amendment should not now place the application in condition for allowance, the Examiner is invited to call undersigned counsel to resolve any remaining issues.

Respectfully submitted,

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